

## POTENTIAL ECONOMIC IMPACTS TO LIVESTOCK GRAZING ACTIVITIES

## SECTION 5

264. This section describes the past and expected future economic impacts to livestock grazing activities in areas proposed as critical habitat for the flycatcher. Specifically, this analysis estimates direct and indirect impacts on grazing due to flycatcher conservation activities. This section is divided into three parts. The first provides an overview of grazing in areas proposed for critical habitat and a general description of recommended conservation activities. Next is a description of the methods used to estimate the economic impacts of grazing restrictions implemented to protect the flycatcher and its habitat. The final section provides a summary of the past and expected future impacts to grazing, by management unit.

### 5.1 Background

265. The proposed critical habitat area for the flycatcher includes areas of USFS, BLM, and private lands that are used for seasonal or year round livestock grazing. Exhibit 5-1 presents the number of acres of USFS, BLM, and non-federal grazing lands included in this proposed designation.

<b>Exhibit 5-1</b>			
<b>ACRES OF USFS, BLM, AND NON-FEDERAL GRAZING LANDS IN PROPOSED FLYCATCHER CRITICAL HABITAT</b>			
<b>Recovery Unit</b>	<b>USFS</b>	<b>BLM</b>	<b>Non-federal</b>
Coastal California	700	-	9,000
Basin and Mohave	500	-	13,100
Lower Colorado	500	20,400	10,800
Gila	24,400	4,800	20,600
Rio Grande	100	4,000	41,200
<b>TOTAL:</b>	<b>26,200</b>	<b>29,200</b>	<b>94,700</b>
Note: Numbers may not sum due to rounding. Sources: For NM, AZ, CO, NV, UT: National Land Cover Data, USGS, 2004, "grasslands/herbaceous" and "shrubland" land classes; For CA: Agricultural land use data, California Division of Land Resource Protection, Department of Conservation, 2004, "Grazing lands" classification.			

266. While livestock grazing does not directly impact the flycatcher, it has the potential to indirectly affect it. The RP states that grazing may affect the flycatcher by:

- Impairing the ability of riparian communities to develop into flycatcher habitat;
- Destroying nests with eggs or young; and
- Facilitating brood parasitism by brown-headed cowbirds.<sup>183</sup>

267. The Recovery Plan notes that “...the effects of livestock grazing vary over the range of the flycatcher, due to variations in grazing practices, climate, hydrology, ecological setting, habitat quality, and other factors. ... Addressing the issue of livestock management in the context of recovery of the southwestern willow flycatcher is therefore complicated.” On Federal lands, specific management of grazing allotments is left to the discretion of the Federal agencies responsible for permitting grazing on their lands. Grazing activities on non-federal lands are discussed in section 5.3.

## **5.2 Overview of Impacts on Federal Grazing Activities**

268. This section discusses the typical project modifications implemented to provide protection for the flycatcher from livestock grazing activities on Federal lands. For allotments where formal consultation was conducted in the past, the USFS and BLM proposed adaptations to accommodate the flycatcher, and in turn the Service presented Reasonable and Prudent Measures and Terms and Conditions for USFS and BLM to follow. This analysis refers to these actions as project modifications. Exhibits 5-2 and 5-3 present a list of example project modifications from past consultations on USFS and BLM grazing allotments. Examples of conservation activities implemented on grazing allotments for flycatcher protection include:

- Conducting surveys at occupied and/or potential flycatcher locations;
- Exclusion or removal of livestock grazing from riparian areas year-round, or during the flycatcher breeding season;
- Monitoring of the entire river corridor to ensure that permitted and trespass cattle remain outside flycatcher nesting areas and riparian corridors; and
- Initiation of cowbird trapping programs during the flycatcher breeding season to reduce the incidence of cowbird parasitism.

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<sup>183</sup> Recovery Plan for the Southwestern willow flycatcher (*Empidonax traillii extimus*), Service, August 2002 (Appendix G).

269. These actions can be grouped into three categories: grazing restrictions, other project modifications, and administrative costs. The following sections provide a discussion of the methodology used to estimate the cost of each of these categories on livestock grazing activities.

<b>Exhibit 5-2</b>	
<b>EXAMPLE PROJECT MODIFICATIONS FROM PAST FORMAL CONSULTATIONS BY USFS ON SOUTHWESTERN WILLOW FLYCATCHER</b>	
<b>Grazing restrictions:</b>	<ul style="list-style-type: none"> <li>• If standardized monitoring indicates that use of apical stems of woody riparian vegetation exceeds 40% (frequency of occurrence), then the Service must remove livestock from riparian area in the affected pasture immediately and shall defer use of the riparian area in the affected pasture in the following year. (a)</li> </ul>
<b>Monitoring and reducing cattle trespassing:</b>	<ul style="list-style-type: none"> <li>• Any trespass livestock found shall be removed from riparian areas immediately and a reasonable effort shall be made to determine and eliminate the source or point of trespass. (a)</li> <li>• Immediately remove all cattle entering the breeding area through breaks in fencing on neighboring allotments. (c)</li> </ul>
<b>Livestock monitoring:</b>	<ul style="list-style-type: none"> <li>• Monitor livestock use of riparian areas to which livestock have access. (a)</li> <li>• Monitor the entire river corridor through the allotment for livestock. (a)</li> <li>• Monitor to ensure that cattle remain outside of the WIFL breeding area and riparian area after March 15 of each year. (c)</li> <li>• Ensure that cattle do not access habitat occupied by flycatcher or its proposed critical habitat, including inspecting and repairing fencing that excludes cattle. (d)</li> </ul>
<b>Cowbird trapping:</b>	<ul style="list-style-type: none"> <li>• Initiate cowbird trapping program by April 1 and continue through July 31, or until the WIFL breeding season has ended. (b, c, d)</li> <li>• If breeding status of any flycatcher observed is confirmed or suspected, begin a brown-headed cowbird trapping program in the following year by April 1. (e)</li> <li>• Maintain data on the brown-headed cowbird trapping program. (e)</li> </ul>
<b>WIFL monitoring:</b>	<ul style="list-style-type: none"> <li>• Monitor WIFL as part of the statewide Partners in Flight survey and monitoring effort. (b, c)</li> <li>• Conduct annual surveys at the project site. (d, e)</li> <li>• Conduct surveys at potential flycatcher locations at least once in each of the last two ten-day periods of May. (d, e)</li> <li>• Determine breeding status of any flycatcher observed. If breeding status is confirmed or suspected, continue monitoring efforts by visiting breeding locations at least once during each of the three 10-day periods of June and July. (e)</li> <li>• Monitor for signs of nest parasitism. (e)</li> </ul>
<b>Surveys:</b>	<ul style="list-style-type: none"> <li>• Map the distribution, size, and areal extent of riparian habitats along the river corridor through the allotment. (a)</li> </ul>
<b>Administrative:</b>	<ul style="list-style-type: none"> <li>• Report to the Service each year on the WIFL survey and cowbird trapping program. (e)</li> </ul>
Sources: (a) 2-21-94-I-559, Tonto National Forest, Yavapai County, AZ, June 25, 1997; (b) 2-21-92-F-693, Eastern Roosevelt Lake Watershed, Gila County, AZ, December 1, 1995; (c) 2-21-92-I-360, Tonto Basin, AZ, November 30, 1995; (d) 2-21-95-F-399, Coconino National Forest, Coconino and Yavapai Counties, AZ, September 27, 1995; (e) 2-21-92-F-500, Coconino National Forest, Yavapai and Coconino Counties, AZ, February 3, 1995.	

**Exhibit 5-3**

**EXAMPLE PROJECT MODIFICATIONS FROM PAST FORMAL CONSULTATIONS  
BY BLM ON SOUTHWESTERN WILLOW FLYCATCHER**

**Grazing restrictions:**

- Livestock grazing shall be restricted to winter grazing of riparian pastures from November 1 to April 1. (a)
- Monitoring of the utilization levels shall be done to ensure <30 percent utilization limits are not exceeded. Once the 30 percent utilization level is met, all livestock will be removed from the pasture. (a)
- Riparian exclosures will be excluded from grazing. The fences of all riparian exclosures shall be inspected and maintained at least twice annually. (c)

**Cowbird trapping:**

- Implement cowbird trapping in the action area if cowbird parasitism results in excess of 5 percent nest failure per year. (a)
- New livestock management facilities that are likely to attract and support cowbirds must be located beyond five miles of occupied, suitable, or potential flycatcher habitat. (b)
- If flycatcher breeding is confirmed or suspected, begin a brown-headed cowbird trapping program in the following year by April 1. (c)
- Monitor for signs of nest parasitism such as cowbirds fledgling from flycatcher nest(s). (c)

**Monitoring and reducing cattle trespassing:**

- Work with private landowners to exclude livestock from Bureau-administered lands. (a)
- Take immediate action to remove trespass cattle from or within 5 miles of occupied flycatcher habitats, and measures, including fences, shall be developed and implemented. (a, b)
- Work diligently with adjacent landowners to ensure that trespass does not continue. (a, b)
- Grazing in riparian pastures with occupied habitat will not be authorized until riparian fencing is completed. (a)

**Maintenance and management activities:**

- Construction, maintenance, and management activities in occupied or suitable flycatcher habitat shall occur outside the SWWF breeding season (April 15 – August 31). (a, b)
- Construction, maintenance, and management activities in occupied SWWF habitat shall be planned to avoid removing trees and shrubs. (a)
- Construction, maintenance, and management activities in occupied SWWF habitat shall be planned to avoid removing willows and cottonwoods. (b)
- Restriction of range improvement activities in the riparian corridor, except for fences, cattle guards, and gates to exclude and better manage cattle. (a, b)
- Fence maintenance of exclosures, riparian pastures, or boundary fences, and sweeps of occupied and unsurveyed suitable habitat will be conducted before each flycatcher breeding season. (b)

**Management plans:**

- If Allotment Management Plans are not yet developed, they shall be completed within three years and implemented no later than two years after completion. (a, b)
- A mitigation plan shall be developed by the Bureau in coordination with the Service for each range improvement project and vegetation management project that may adversely affect the SWWF, and for each prescribed fire in the allotments. (b)

**Monitoring:**

- Monitor incidental take resulting from the proposed action and report the findings of that monitoring. (a, b)
- Conduct annual surveys for flycatcher along the river and its tributaries that may provide suitable habitat. If flycatchers are detected, determine their breeding status. (c)

**General:**

- Conduct all proposed actions in a manner that will minimize take of southwestern willow flycatchers and minimize the suitability of the area for cowbird habitation. (c)
- Work with the Natural Resource Conservation Service and landowners in the allotments to develop and implement watershed improvement projects and will increase infiltration. (b)

Sources: (a) 2-21-00-F-0029, Middle Gila River Ecosystem, Gila and Pinal Counties, AZ, October 23, 2003; (b) 2-21-96-F-160, Safford and Tuscon Field Office's Livestock Grazing Program, Southeastern, AZ, September 26, 1997; (c) 2-21-95-F-177, Empire-Cienega Ranch, Pima County, AZ, January 8, 1996.

### 5.2.1 AUMs and permit value on Federal lands

270. The greatest economic impact of flycatcher conservation on grazing activity occurs when restrictions on the use of riparian areas for livestock grazing are implemented. Exclusion of riparian areas from grazing can result in a reduction in the number of permitted AUMs (animal unit months: forage for one cow and calf for one month) on the allotment. This section provides a discussion of the methodology used to estimate the economic value of reductions in permitted AUMs.
271. The system of Federal grazing permits in the American West was established on USFS lands in the early 1990s and on BLM lands by the Taylor Grazing Act of 1934.<sup>184</sup> In most areas, qualifying ranches (“base properties”) were assigned an exclusive amount of AUMs based on the carrying capacity of the grazing allotment.<sup>185</sup> These allotments were connected to private holdings through the establishment of renewable leases that were both inheritable and transferable with the sale of the land or, in the case of USFS permits, the transfer of the livestock (pending the approval of the USFS or the BLM). As a result of this attachment of the grazing permit to the base properties, real estate markets adjusted the value of those properties to reflect the Federal AUMs associated with the grazing permits, or permit value.<sup>186</sup>
272. This concept of permit value, however, has been an issue of debate. A 1970 court decision, Pankey Land and Cattle Co. v. Hardin, 427 F.2d 43 (10<sup>th</sup> Cir. 1970), formed the basis for the government’s position that ranchers “are not given title to the grazing resource and as such do not own a property right or have a corresponding economic right to permit value.”<sup>187</sup> Nonetheless, numerous published studies have found that a rancher obtains a value for holding a Federal grazing permit whether or not he has title to the permit, and whether or not he sells his property.<sup>188</sup> Furthermore, if the grazing fee is below the value of grazing, and if the permit is renewable from year to year in a dependable fashion, then the economic

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<sup>184</sup> Grazing fees on USFS lands was first introduced in 1906. (Cody, B.A. 1996. *Grazing Fees: An Overview*. Congressional Research Service. Washington, D.C.)

<sup>185</sup> Kerr, Andy. 1998. “The Voluntary Retirement Option for Federal Public Land Grazing Permittees. *Rangelands*.” Vol. 20, No. 5. October. 26-30.

<sup>186</sup> Stern, B.S. 1998. “Permit Value: A Hidden Key to the Public Land Grazing Dispute.” M.S. Thesis. University of Montana. March 1998.

<sup>187</sup> Torell et al. “The Market Value of Public Land Forage Implied from Grazing permits.” *Current issues in Rangeland Economics*: 1994. Western Research Coordinating Committee 55: Range Economics, 1994.

<sup>188</sup> “The general observation is that public land grazing permits do have market value,” Torell et al. “The Lack of Profit motive for ranching: Implications for policy analysis.” *Current issues in Rangeland Economics*, Western Coordinating Committee 55 (WCC-55), 2001. Torell, L. Allen and S.A. Bailey. “Public land policy and the value of grazing permits.” *Western Journal of Agricultural Economics*, Volume 16 (174-184), 1991. Also see Rowan, R. C., and J.P. Workman. “Factors affecting Utah ranch prices.” *Journal of Range Management*. Volume 45 (263-266), 1992. Sunderman, M. A., and R. Spahr. “Valuation of government grazing leases.” *Journal of Real Estate Research*, Volume 9 (179-196), 1992. Spahr, R. and M.A. Sunderman. “Additional evidence on the homogeneity of the value of government grazing leases and changing attributes for ranch value.” *Journal of Real Estate Research*, Volume 10 (601-616), 1995. Torell, L. Allen and M.E. Kincaid. “Public land policy and the market value of New Mexico ranches, 1979-1994.” *Journal of Range Management*, Volume 49 (270-276), 1996.

rents (the difference between the fee and the value of grazing) will be incorporated and reflected into the value of the grazing permit.<sup>189</sup>

273. Thus, permit value can be used as a measure of rancher wealth tied up in grazing permits and forced reductions in permitted AUMs can be represented by a loss in permit value, or rancher wealth (regional livestock production loss and regional economic impacts are discussed later in this section).
274. Numerous publications support this concept of permit value. For example, Torell et al., states that “permit value represents the only available direct valuation of public land forage, except for a few scattered instances where public land is competitively leased. Using an appropriate capitalization rate, annualized estimates of forage value can be determined from the observed permit value.”<sup>190</sup> In a summary of recommended forage valuation methods, the author states that “permit values provide a direct and site-specific estimate of forage value. Theoretically, this estimate should provide a site-specific estimate of value while considering the inherent production characteristics, regulations, and economic potential of specific allotments.”<sup>191</sup> As defined in a public comment from the New Mexico Department of Agriculture, “permit value is essentially a measure of rancher wealth based on the number of federally permitted AUMs he is allowed to graze, the value of the Federal grazing fee, and the private property rights owned by the permittee.”<sup>192</sup> Exhibit 5-4 presents the results of nine recent studies that attempt to measure the permit value, in perpetuity, of Federal grazing (per AUM), by permitting agency (USFS and BLM).
275. The range of values found in these studies likely results from variations in factors, such as study method, region, quality of forage, substitute availability, and capitalization rates. This analysis adopts an estimated permit value, in perpetuity, per AUM as the average of the permit value studies above, or \$88 per BLM AUM and \$80 per USFS AUM.

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<sup>189</sup> Technical advisor review comments of B. Delworth Gardner, Brigham Young University, December 18, 2005.

<sup>190</sup> Torell et al. “The Lack of Profit motive for ranching: Implications for policy analysis.” Current issues in Rangeland Economics, Western Coordinating Committee 55 (WCC-55), 2001.

<sup>191</sup> Torell, L. Allen et al. “Theoretical Justification and Limitations of Alternative Methods used to value public land forage.” 1994. Western Research Coordinating Committee 55: Range Economics, 1994.

<sup>192</sup> Private property referred to here reflect private land values. Public comment on Draft Economic Analysis of Critical Habitat for the MSO from Julie Maitland, Division Director, New Mexico Department of Agriculture, April 26, 2004.

Exhibit 5-4					
SUMMARY OF RELEVANT PERMIT VALUE ESTIMATES FOR BLM AND USFS PERMITS					
Study	Method	Years	Location	\$/BLMAUM (2004\$)*	\$/FSAUM (2004\$)*
Rowen & Workman	Regression	1975-1987	Utah	\$32	\$32
Torell & Doll	Regression	1979-1988	New Mexico	\$97	\$97
Rowen & Workman	Regression	1980-1988	Utah	\$60	\$60
Torell & Kincaid	Various	1988	New Mexico	\$107	\$100
Torell et al.	Regression	1992	New Mexico	\$110	\$89
Kincaid	Regression	1987-1994	New Mexico	\$101	\$98
Torell & Kincaid	Various	1994	New Mexico	\$103	\$71
Torell et al.	Case studies	2002	Idaho, Nevada, Oregon	\$95	\$95
Average:				<b>\$88</b>	<b>\$80</b>
* Numbers represent the permit value per AUM in perpetuity. Values adjusted using the GDP Deflator, Budget of the United States Government, Fiscal Year 2005, Historical Tables. Sources: Department of Commerce, Bureau of Economic Analysis, 2004. Sources: Stern, Bill S. "Permit Value: A Hidden Key to the Public Lands Grazing Dispute," University of Montana, Master of Science thesis, 1998; Torell et al., "Ranch level impacts of changing grazing policies on BLM land to protect the Greater Sage-Grouse: Evidence from Idaho, Nevada, and Oregon." Policy Analysis Center for Western Public Lands, Policy Paper SGB01B02, 2002.					

## 5.2.2 Reductions in AUMs on Federal lands related to flycatcher conservation activities

276. On some allotments that contain flycatcher habitat, riparian areas have been excluded from grazing either year-round or seasonally thus reducing the carrying capacity, or permitted AUMs. These reductions in AUMs have impacted the ranchers that graze those lands. However, a complete history of the changes to authorized and permitted head, utilization, and AUMs by allotment over time due to flycatcher is not available. In addition, two complications arise when estimating the number of AUM reductions associated with restrictions on riparian grazing:

- (1) Numerous factors affect the number of permitted and authorized AUMs approved by USFS and BLM for any given grazing allotment, and often AUM reductions due to the flycatcher cannot be separated from other causes: and
- (2) In some cases, restrictions on grazing allotments have been limited to the exclusion of only the riparian corridor from grazing during the flycatcher breeding season from May 1 through September 1. According to conversations with USFS and BLM staff, AUM reductions have been avoided in the past for this type of restriction through offsetting increases in the number of head during non-flycatcher breeding months, or by changing grazing management schemes to avoid excluded riparian corridors.

These two complications are explored further in the following sections.

*Factors affecting permitted and authorized AUMs*

277. On a particular allotment containing flycatcher habitat, reductions to authorized or permitted AUMs made by USFS or BLM may be: (1) directly related to flycatcher conservation; (2) not related to flycatcher conservation at all; or (3) a combination of factors. These scenarios are described below:

- (1) *Causes directly related to flycatcher.* Even though livestock grazing does not directly harm flycatchers, Action agencies have had to consider potential impacts of livestock grazing actions on flycatcher in habitat areas since its listing. In a 2001 hearing with the New Mexico Public Land Grazing Task Force (New Mexico Task Force), Federal agencies in New Mexico cited compliance with Federal laws as a key factor that affects their management of livestock grazing.<sup>193</sup> As part of a survey, the New Mexico Task Force asked USFS and BLM permittees whether decreases in the permitted number of livestock on their allotments were due to the presence of federally listed endangered or threatened species (Exhibit 5-5). Their answers indicate that endangered species considerations have influenced the number of permitted AUMs, particularly on National Forest lands.<sup>194</sup> Although not definitive, this survey supports the assertion that flycatcher considerations may affect the number of permitted AUMs on allotments.

<b>Exhibit 5-5</b>	
<b>RESPONDENTS CLAIMING REDUCTIONS IN PERMITTED AUMS DUE TO PRESENCE OF THREATENED AND ENDANGERED SPECIES</b>	
<b>Grazing Area</b>	<b>Percent</b>
Carson NF	23
Cibola NF	2
Gila NF	42
Lincoln	7
Santa Fe NF	2
New Mexico BLM*	5
Notes: (1) The survey question was not specific to flycatcher, thus drawing conclusions from this study about reductions in AUMs that may have resulted from flycatcher conservation activities is not possible. (2) BLM percentage presented is an average of the four offices. The Task Force sent surveys to 1,128 USFS permittees and 2,045 BLM permittees. They received responses from 322 USFS and 482 BLM permittees, or 29 and 24 percent, respectively. Source: "Report to the Governor of New Mexico from the Public Land Grazing Task Force," prepared by George A. Douds, New Mexico Department of Agriculture, 2002, Appendices D, E and F.	

<sup>193</sup> "Report to the Governor of New Mexico from the Public Land Grazing Task Force," prepared by George A. Douds, New Mexico Department of Agriculture, 2002.

<sup>194</sup> While this survey does not present a definitive answer to the question posed, it suggests that AUM reductions may be, in part, associated with endangered species considerations. However, the survey question was not specific to flycatcher, thus drawing conclusions from this study about reductions in AUMs that may have resulted from flycatcher conservation activities is not possible.

- (2) *Causes unrelated to flycatcher.* When Federal agencies assess an allotment for permit renewal, they must also consider weather conditions (drought), forage availability, presence of other ungulates, such as elk, as well as presence of other sensitive, threatened and endangered species. For example, past reductions in AUMs were prompted in the Tonto National Forest because of drought and on Arizona BLM allotments along the Virgin River due to the presence of the endangered desert tortoise.
- (3) *Combination of Causes.* In most cases, however, decisions by Federal agencies to change the permitted or authorized AUMs in flycatcher habitat areas is a combination of considerations that include the flycatcher, other endangered species, other regulatory considerations (such as Grazing Guidance Criteria, Forest Plans, and Resource Management Plans), current forage availability, general health of the riparian corridor, and weather conditions. In addition, subjective factors such as political pressures from interest groups or other land user groups may also influence agency decisions. These subjective impacts are the most difficult to predict, but may play an important role in the decisionmaking process.

278. For allotments that have gone through formal section 7 consultations, or the NEPA permit issuance processes, specific changes directly caused by the flycatcher can be described and documented. However, not all changes to the permitted AUMs may be directly attributable to flycatcher conservation activities, and as described above, the spatial and temporal overlap with flycatcher consultation activities makes separating these impacts difficult.

279. In the past, the most frequent cause of riparian grazing exclusion were “general riparian health” and/or “protection of endangered riparian species.” For example, in 1998, USFS Region 3 conducted a region-wide consultation on all of their grazing actions, resulting in the allotment-by-allotment review of 963 allotments. This review was the result of two lawsuits filed against the USFS by environmental groups in 1997, the Forest Guardians and the Center for Biological Diversity. The Forest Guardians’ initial lawsuit focused upon four endangered and threatened species: the flycatcher, the loach minnow, the spikedace, and the Mexican spotted owl (MSO). Their lawsuit challenged the issuance of grazing permits on allotments located in the Apache-Sitgreaves, Carson, Cibola, Gila, Prescott and Santa Fe National Forests. The Center for Biological Diversity’s initial lawsuit did not focus on any specific endangered or threatened species, but challenged the issuance of grazing permits on allotments in six national forests: Apache-Sitgreaves, Coconino, Coronado, Gila, Prescott, and Tonto. Because the complaints shared common issues and challenged many of the same allotments, the cases were consolidated.

280. In response to the lawsuit, USFS initiated informal consultation with the Service in February 1998 on the 158 allotments named in the complaints as well as hundreds of other allotments (962 in total) in the National Forests of Arizona and New Mexico (USFS Region 3). The purpose of the consultation was to determine the potential effects of livestock grazing on endangered and threatened species on the allotments and therefore whether formal consultation between the Forest Service and the Service was necessary. As part of

the informal consultation process, the Forest Service also developed “Grazing Guidance Criteria for Preliminary Effects Determinations for Species Listed as Threatened, Endangered, or Proposed for Listing,” (“Guidance Criteria”) dated February 13, 1998.

281. Of the 962 allotments under consultation, 619 “No Effect,” 321 “NLAA” (not likely to adversely affect) findings, and 22 “LAA” (likely to adversely affect) determinations were made. “No Effect” findings concluded the Forest Service’s obligations under the Act and do not require Service concurrence. The Forest Service received concurrence from the Service for the 321 “NLAA” determinations thus no further action was necessary on those allotments.
282. This left 22 allotments where the Forest Service made LAA determinations with regards to the loach minnow. In February 1999, the Service released a biological opinion in which it concluded that the impacts of grazing on 21 of the 22 allotments would not jeopardize the continued existence of the loach minnow.
283. The 962-allotment review prompted both Plaintiffs to amend their complaints in September 1999. The Forest Guardians narrowed their complaint to the loach minnow, the spokedace, and the Mexican spotted owl (the MSO) on allotments in the Apache-Sitgreaves, Gila and Cibola National Forests while the Center for Biological Diversity re-focused their complaint to the loach minnow and spokedace on allotments in the Apache-Sitgreaves and Gila National Forests.<sup>195</sup>
284. The result of this process was the exclusion of the majority of the riparian corridors on grazing allotments in USFS Region 3.<sup>196</sup> In these cases, it is clear that the riparian exclusions were a result of a combination of causes, to which the flycatcher contributed but was not the primary driving factor. However, because of the temporal and spatial overlap, it is difficult to separate flycatcher-related impacts from the other causes.

#### *Avoiding AUM Reductions*

285. According to USFS and BLM staff, range managers can sometimes avoid AUM reductions when grazing restrictions are put in place for flycatcher through changes in grazing management practices. For example, in the Apache-Sitgreaves forest, three flycatcher nesting sites were identified on allotments along the Little Colorado River. Grazing was restricted within a two mile radius around these sites during the flycatcher breeding season. Due to the small number of acres excluded relative to the entire allotment, USFS range managers were able to alter grazing patterns to avoid these areas during the summer without reducing AUMs. Another example of this type occurred with the exclusion of grazing during the flycatcher breeding season on the Bruton River allotment, administered by New Mexico BLM. Initially this allotment was authorized for 1800 AUMs for 150 head

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<sup>195</sup> United States District Court of Arizona. Southwest Center for Biological Diversity, et al., Plaintiffs v. United States Forest Service et al., Defendants, and Arizona Cattle Growers’ Association, Applicant-in-Intervention. Forest Guardians, Plaintiff vs. United States Forest Service, et al., Defendants. No. CV 97-666 TUC JMR consolidated with No. CIV 97-2562 PHX-SMM.

<sup>196</sup> Personal communication, Wally Murphy, USFS Region 3, September 3, 2004.

year-round. To avoid reducing AUMs, after the exclusion of grazing during the flycatcher breeding season, BLM increased the number of head authorized during rest of the year from 150 to 198 cows, thereby maintaining an authorization of 1800 AUMs. However, these approaches to management may result in other costs, such as losses in flexibility and increases in the time permittee must commit to livestock management to ensure that cows do not wander into flycatcher-protected areas.<sup>197</sup>

*Estimating Flycatcher-related AUM Reductions on Federal Grazing Lands*

286. As a result of these complications, this analysis includes a low and high estimate of AUMs reduced due to the flycatcher.

**Low Estimate**

287. The low estimate uses the following criteria:
- 1) For allotments identified by wildlife biologists, range managers, and permittees as impacted by actions directly related to flycatcher protection, this analysis utilized the AUM reductions estimated by these entities;
  - 2) For allotments where proposed critical habitat is equal to less than five percent of total allotment area, this analysis assumes that changes in grazing management practices are available to avoid AUM reductions; and
  - 3) For allotments where proposed critical habitat is equal to more than five percent of total allotment area, this analysis assumes the reduction in AUMs due to flycatcher is proportional to the percentage of the allotment designated as proposed flycatcher critical habitat.

**High Estimate**

288. The high estimate uses the following criteria:
- 1) For allotments identified by wildlife biologists, range managers, and permittees as impacted by actions directly related to flycatcher protection, this analysis utilizes the AUM reductions estimated by these entities;
  - 2) For allotments where the number of AUM reductions directly related to flycatcher protection is not known, this analysis assumes the

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<sup>197</sup> Personal communication, Vicente Ordonez, Apache-Sitgreaves National Forest, August 13, 2004; Personal communication, Ralph Pope, Gila National Forest, August 27, 2004.

reduction in AUMs due to flycatcher is proportional to the percentage of the allotment designated as proposed flycatcher critical habitat.

- 3) For allotments where the number of AUMs in an allotment is unavailable, this analysis calculates the reduction in AUMs due to flycatcher by multiplying the average number of AUMs reduced per acre (derived from allotments where AUM data are available, or 0.23 AUMs per acre), by the number of acres of grazing land in critical habitat. Exhibit 5-6 presents the derivation of the average AUMs reduced.

289. As a result of the second and third criteria above, the high estimate effectively allocates grazing impacts to all allotments included in the proposed flycatcher critical habitat area.<sup>198</sup>

<b>Exhibit 5-6</b>	
<b>AVERAGE AUMS REDUCED DUE TO FLYCATCHER PER ACRE OF PROPOSED FLYCATCHER CRITICAL HABITAT</b>	
<b>Management Unit</b>	<b>Average AUMs Reduced per Acre of Proposed Flycatcher Critical Habitat</b>
San Diego	0.73
Kern	1.04
Little Colorado	0.34
Virgin	0.03
Bill Williams	0.03
Parker to Southerly International	0.02
Verde	0.15
Roosevelt	0.13
Middle Gila/San Pedro	0.13
Upper Gila	1.05
Upper Rio Grande	1.42
Middle Rio Grande	0.31
<b>Average:</b>	<b>0.23</b>
Source: IEc analysis.	

### 5.2.3 Administrative and Other Project Modifications

290. In addition to AUM reductions, the Service has also included stipulations for other modifications to grazing permits and administrative requirements. Administrative requirements include the costs associated with biological opinions and writing annual reports to the Service. These costs are included in Section 3. In addition, the Service also requires flycatcher survey and monitoring. These costs are included in Section 8.

<sup>198</sup> Exceptions include allotments identified by range managers as (1) allotments closed prior to listing of the flycatcher, (2) ephemeral allotments where no AUMs are currently authorized; and (3) allotments identified as not touching the river or where livestock access to the river is prevented (e.g., highway crossings or canyons).

291. Other project modifications consist of constructing and maintaining riparian exclusion fencing and initiating cowbird trapping programs. Estimates for the past costs of these project modifications are based on conversations with wildlife biologists, range management specialists, and permittees. As shown in Exhibit 5-7, future costs are estimated by calculating the average of all past costs for USFS and BLM, divided by the total number of administrative units, or \$13,000 per year (2004 dollars).

<b>Exhibit 5-7</b>					
<b>ESTIMATION OF FUTURE COSTS OF OTHER PROJECT MODIFICATIONS, PER PROJECT (2004\$)</b>					
<b>Other Project Modifications</b>	<b>Total Past Costs*</b>	<b>Number of Years</b>	<b>Cost per Year</b>	<b>Number of Administrative Units</b>	<b>Past Cost per Administrative Unit</b>
Cowbird trapping	\$342,157	13	\$26,320	6	\$4,400
Exclosure construction	\$452,135	9	\$50,237	7	\$7,200
Exclosure maintenance	\$65,193	10	\$6,519	5	\$1,300
<b>TOTAL:</b>					<b>\$13,000</b>
* Based on conversations with wildlife biologists, range management specialists, and permittees.					

### **5.3 Impacts on Non-federal Grazing Activities**

292. Flycatcher conservation activities may also impact non-federal grazing activities to the extent that private landowners modify grazing practices in order to avoid incidental take under section 9.<sup>199</sup> Determining the economic impact to non-federal grazing activities requires an estimate of the number of acres of non-federal grazing lands and a measure of the number of cattle that could be supported by these lands (e.g., AUMs), and the value per AUM of private grazing lands. This section describes the methodology used to estimate the economic impact of the flycatcher on non-federal grazing activities.

#### *Identifying Non-federal Grazing Lands*

293. With the exception of California, accurate geographic data on the number of acres of non-federal lands used for livestock grazing activities are not available.<sup>200</sup> In California, the Division of Land Resource Protection under the Department of Conservation maintains geographic data of agricultural land uses by county. This data includes grazing lands, defined as land on which the existing vegetation is suited to the grazing of livestock, co-developed in cooperation with the California Cattlemen's Association, University of

<sup>199</sup> It is worth noting that no consultations or HCPs currently exist that affect private grazing in flycatcher habitat areas. The Service questions the assumption that critical habitat designation will affect private grazing efforts in the future. Comments of Regional Director, Service Region 2, Albuquerque, NM, January 5, 2005; Comments of Southwest Regional Office of the Solicitor, January 3, 2005; Comments of Service, Grand Junction, Colorado, Ecological Services Office, January 3, 2005;

<sup>200</sup> The 2002 Census of Agriculture reports the number of acres of farmland by county and state and the National Agricultural Statistics Service reports the number of livestock operations by state. However, neither sources provide accurate data in GIS form on the acreage of non-federal lands used for livestock grazing.

California Cooperative Extension, and other groups interested in the extent of grazing activities.<sup>201</sup>

294. For New Mexico, Utah, Arizona, Colorado, and Nevada, this analysis relies on geographic land cover data identifying rangeland vegetation to estimate the acres of non-Federal lands grazed in proposed CHD. The National Land Cover Data (NLCD), maintained by the USGS, was developed using satellite imagery for the purpose of generating a generalized and nationally consistent land cover data set. The NLCD classification consists of 21 different land cover categories. Rangelands are identified through a combination of two land classes, “grasslands /Herbaceous” and “shrubland”.<sup>202</sup>

*Estimating Flycatcher-related AUM Reductions on Non-federal Grazing Lands*

295. This analysis did not identify any past flycatcher consultations or HCPs for livestock grazing activities on non-federal lands. Therefore, this analysis only includes an estimate of lost AUMs on non-federal lands in the high estimate of grazing impacts.<sup>203</sup>
296. To estimate the number of private grazing AUMs that may be reduced in to avoid incidental take under section 9 of the Act, this analysis relies on a 1989 study prepared for the California Department of Forestry and Fire Protection profiling the California Livestock Industry. As part of this study, the productivity of grazing lands for privately owned or leased land was compared to the productivity of land leased from USFS and BLM. On average, depending on vegetation type, this study found that private lands range from being as productive to up to 17 times as productive as USFS and BLM grazing lands. To estimate the number of AUMs reduced on non-federal grazing lands in the proposed CHD, this analysis utilizes the weighted average of these data, or 0.93 AUMs per acre, which suggests that private lands, on average, are four times as productive as Federal lands.

*Value per AUM on Non-Federal Grazing Lands*

297. This section provides a discussion of the methodology used to estimate the economic value of reductions in AUMs on non-federal lands. Since 1979, fees for grazing on Federal public lands have been determined by a formula established initially by the Public Rangeland Improvement Act of 1978 and then in 1986, by Executive Order 12548. This formula relies on a number of components, including grazing rates on private lands across 17 states based

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<sup>201</sup> Land use maps were not available for the Owens River area in Inyo and Mono Counties. However, conversations with the major landowner along the Owens River, the City of Los Angeles Department of Water and Power, indicated that the City administers grazing allotments in this area. As a result, land owned by the City along the Owens River in the Owens MU is included in this analysis (Personal communication, Brian Tillemans, City of Los Angeles Department of Water and Power, September 8, 2004).

<sup>202</sup> Grasslands/Herbaceous are areas dominated by upland grasses and forbs. Shrublands are areas characterized by natural or semi-natural woody vegetation with aerial stems, generally less than 6 meters tall, with individuals or clumps not touching to interlocking.

<sup>203</sup> As stated above, the Service questions the assumption that critical habitat designation will affect private grazing efforts in the future. Comments of Regional Director, Service Region 2, Albuquerque, NM, January 5, 2005; Comments of Southwest Regional Office of the Solicitor, January 3, 2005; Comments of Service, Grand Junction, Colorado, Ecological Services Office, January 3, 2005;

on survey of monthly lease rates and reported by the USDA's National Agricultural Statistics Services. Exhibit 5-8 summarizes the grazing fee rates for cattle (per AUM) on private non-irrigated lands for those states included in the proposed designation. This analysis utilizes these private grazing fee rates per AUM, in perpetuity, to estimate the economic losses associated with potential AUM reductions on non-federal lands to avoid incidental take.

<b>Exhibit 5-8</b>		
<b>PRIVATE NON-IRRIGATED GRAZING FEE RATES FOR CATTLE BY STATE</b>		
<b>State</b>	<b>\$/AUM</b>	
	<b>2003</b>	<b>Perpetuity (\$2004)*</b>
Arizona	\$7.50	\$109
California	\$13.50	\$195
Colorado	\$13.00	\$188
Nevada	\$10.50	\$152
New Mexico	\$8.60	\$124
Utah	\$11.60	\$168
* Calculated into perpetuity assuming a seven percent discount rate. Values adjusted to \$2003 using "Table 1.1.9. Implicit Price Deflators for Gross Domestic Product", Department of Commerce, Bureau of Economic Analysis, 2004. Source: NASS. 2004. Agricultural Prices 2003 Summary. USDA.		

#### **5.4 Past and Future Impacts of Flycatcher Conservation on Federal and Non-federal Grazing Activities**

298. This section discusses the past and future impacts of flycatcher conservation activities on USFS, BLM, and non-federal lands by looking at reductions in grazing effort (lost permit value), costs of other project modifications, and regional economic impacts. Exhibits 5-7 and 5-8 present the total past and future economic impacts on livestock grazing due to the flycatcher conservation activities.

299. The following sections provide summaries of past and future flycatcher conservation activities and the status of grazing within the riparian corridor on Federal grazing lands by management unit. Impacts to livestock grazing activities on private lands are detailed in Exhibit 5-8.

##### **5.4.1 COASTAL CALIFORNIA RECOVERY UNIT**

300. The Coastal California Recovery Unit is made up of three MUs. The Santa Ynez MU falls primarily on private lands. In the Santa Ana and San Diego MUs, USFS owns and administers grazing allotments within the San Bernardino and Cleveland National Forests.

#### **5.4.1.1 Santa Ana Management Unit**

##### *Forest Service*

301. One allotment, Santa Ana, overlaps proposed flycatcher critical habitat in the San Bernardino National Forest. This allotment has not been in use since 1991 when the permittee quit ranching and abandoned the permit. There are no present plans to reauthorize grazing on this allotment, and due to the poor condition of foraging material and overgrown chaparral vegetation, it is not expected that grazing will be reinitiated in the future.<sup>204</sup>

#### **5.4.1.2 San Diego Management Unit**

##### *Forest Service*

302. Three allotments overlap with proposed flycatcher critical habitat areas in the Cleveland National Forest. Two of these allotments, Pamo and Lusardi, were retired in 1998 in order to protect for the flycatcher.<sup>205</sup> However, fencing was installed on the third allotment, Mesa Grande, along with various other allotments, to protect the riparian corridor for the flycatcher and other riparian species.

### **5.4.2 BASIN AND MOHAVE RECOVERY UNIT**

303. The Basin and Mohave recovery unit is made up of four management units. The Salton MU falls primarily on private lands. The Owens MU includes non-federal grazing lands administered by the City of Los Angeles. In the Kern and Mohave MUs, USFS owns and administers grazing allotments within the Sequoia and San Bernardino National Forests.

#### **5.4.2.1 Kern Management Unit**

##### *Forest Service*

304. One allotment, Lake Isabella, overlaps proposed flycatcher critical habitat areas in the Sequoia National Forest. When the flycatcher was listed in 1995, livestock use of the riparian areas of this 1,900-acre allotment was discontinued during the flycatcher breeding season (June 1 to September 15). According to the permittee, this seasonal closure resulted in the reduction of 250 AUMs.<sup>206</sup>

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<sup>204</sup> Email communications with Steve Loe, Forest Biologist, USFS San Bernardino National Forest, August 19, 2004; August 20 2004; September 23, 2004.

<sup>205</sup> These two allotments were closed as a result of cost prohibitive conservation activities required to protect for the flycatcher from ongoing grazing activities, primarily a required program of cowbird trapping. (Email communications with Kirsten Winter, Forest Biologist, USFS Cleveland National Forest, August 16, 2004.)

<sup>206</sup> Personal communication with Bruce Hafenfeld, Lake Isabella Allotment Permittee, August 26, 2004.

#### **5.4.2.2 Mohave Management Unit**

##### *Forest Service*

305. One allotment, Deep Creek, overlaps proposed flycatcher critical habitat areas in the San Bernardino National Forest. Multiple permit violations by the permittee and a general decline in the overall health of the riparian habitat resulted in the formal exclusion of livestock grazing in 1999. According to the Forest Biologist, efforts to exclude livestock on the allotment were ongoing for many years prior to any knowledge of the presence of flycatchers in the drainage area.<sup>207</sup>

#### **5.4.3 LOWER COLORADO RECOVERY UNIT**

306. The Lower Colorado recovery unit is made up of six MUs. The Hoover to Parker MU falls on lands owned by a variety of entities, including state, private, and tribal lands; and the Paranaghat MU falls primarily on National Wildlife Refuge lands and private lands. Large areas of the remaining five MUs fall within lands owned by USFS and BLM, and used for grazing activities. The Little Colorado MU falls exclusively on USFS lands in the Apache-Sitgreaves National Forest while the remaining four MUs fall on land held by a variety of landowners, the largest of which is BLM.

##### **5.4.3.1 Little Colorado Management Unit**

##### *Forest Service*

307. Three allotments overlap with proposed flycatcher critical habitat in the Apache-Sitgreaves National Forest. Approximately 50 to 60 percent of the riparian areas in these allotments were excluded from grazing in the early 1990s as a result of continuing conflict between grazing and recreation use in the riparian corridor.<sup>208</sup> Past flycatcher conservation activities include the exclusion of livestock grazing within a two-mile radius around confirmed flycatcher nesting sites within each of these allotments. In the future, it is possible that the remaining 40 to 50 percent of the riparian area could be excluded from grazing.

##### **5.4.3.2 Virgin Management Unit**

308. The Virgin MU includes grazing allotments on BLM lands in Arizona and Utah. Grazing allotments on BLM lands along the Virgin River in Nevada do not have access to the river, which is owned by private landholders.<sup>209</sup>

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<sup>207</sup> Email communications with Steve Loe, Forest Biologist, San Bernardino National Forest, August 201 2004; September 23, 2004.

<sup>208</sup> Personal communication with Vicente Ordonez, Wildlife Biologist, USFS Apache-Sitgreaves National Forest, September 13, 2004.

<sup>209</sup> Personal communication, David Waller, NV BLM, September 13, 2004.

*Arizona Bureau of Land Management*

309. Seven allotments on lands owned by BLM in Arizona overlap with the proposed Virgin River unit . BLM consulted with the Service on three of these allotments in 1998, resulting in seasonal restrictions on grazing from March 16 to October 15 for the desert tortoise.<sup>210</sup> Flycatcher surveys to date have not indicated the presence of the species.
310. The remaining four allotments are currently the subject of a consultation with the Service expected to be completed by June 2005. Grazing on one allotment is currently year-round while the other two allotments are seasonally restricted to grazing during the winter months for the desert tortoise. Flycatcher surveys for these allotments have also been negative. Flycatcher-related costs are limited to the co-extensive future impacts of seasonal restrictions imposed on grazing activities.

*Utah Bureau of Land Management*

311. Five BLM allotments on lands owned by the federal government in Utah overlap with the proposed Virgin River MU. Grazing is authorized only during the winter months, outside of the flycatcher breeding season, for four of these allotments.<sup>211</sup> Year-round grazing is authorized on the fifth allotment, and no conservation activities for the flycatcher have been implemented. Livestock grazing in the riparian area is authorized on this fifth allotment. If livestock grazing on the riparian portion of this unit were completely removed in the future, there would be a loss of 20-acres to grazing and five AUMs per year.<sup>212</sup>

**5.4.3.3 Bill Williams Management Unit**

312. The Bill Williams MU includes livestock grazing administered by BLM along the Big Sandy River, Bill Williams River, and the Santa Maria River (including upper Alamo Lake). No past conservation activities for the flycatcher have been implemented on any of these allotments. A discussion of the potential for future restrictions on grazing in the riparian areas of each river segment during the flycatcher breeding season follows.

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<sup>210</sup> Consultation No. 2-21-96-F-132.

<sup>211</sup> Summer grazing is not typically authorized due to the low elevation of these allotments, and thus weather that is too hot during the summer to sustain grazing (Personal communication, Bob Douglas, Wildlife Biologist, UT BLM, October 1, 2004).

<sup>212</sup> The current configuration of the Riverview allotment encompasses 960-acres, 20 of which are in riparian habitat. Twenty three AUMs are authorized for this allotment, five of which are authorized in the 20-acre riparian habitat (Email communication with Bob Douglas, Wildlife Biologist, UT BLM, October 1, 2004).

*Arizona Bureau of Land Management*

313. On the Big Sandy River, 13 allotments overlap proposed flycatcher critical habitat areas. Year-round livestock grazing is authorized on ten of these allotments.<sup>213</sup> Future impacts could result from the flycatcher, as riparian grazing is currently allowed on these allotments.
314. Only one allotment, Planet, overlaps with proposed flycatcher critical habitat areas on the Bill Williams River. According to the Lake Havasu Field Office, this allotment has not been in use since 1983. In addition, if grazing is reauthorized on this allotment, the allotment is currently classified for “ephemeral grazing operations only”; as a result, livestock are removed each year by the end of April.<sup>214</sup>
315. Four allotments overlap with proposed flycatcher critical habitat areas on Alamo Lake. Three of these allotments are currently closed to grazing and the fourth, Palmertia, is authorized for year-round grazing.<sup>215</sup>

**5.4.3.4 Parker to Southerly Management Unit**

*Arizona Bureau of Land Management*

316. Three allotments overlap with proposed flycatcher critical habitat areas along the Colorado River. Livestock do not have access to the riparian corridor on the Ganado allotment due to a highway crossing; the Ehrenberg allotment has not been in use since 1971 with no future plans to reauthorize; and the Bishop allotment is currently authorized for grazing from October to March, outside the flycatcher breeding season.<sup>216</sup>

**5.4.4 GILA RECOVERY UNIT**

317. This unit includes the Gila River watershed, from its headwaters in southwestern New Mexico downstream to its confluence with the Colorado River. This Recovery Unit includes USFS and BLM grazing lands in the Verde, Roosevelt, Upper Gila, and Middle Gila/San Pedro MUs.

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<sup>213</sup> Of the remaining three allotments, one allotment is only authorized for ephemeral grazing, the second is authorized during the fall/winter season only (outside of the flycatcher breeding season), and the third is already on a deferred rotational grazing pattern outside of the flycatcher breeding season (Email communication, Rebecca Peck and Jack Spears, AZ BLM, Kingman Field Office, September 22, 2004). Ephemeral grazing is a category of BLM rangeland that generally lies within the southwest desert region. This region is characterized by desert type vegetation, which does not consistently produce forage, but periodically provides annual vegetation suitable for livestock grazing. In years of abundant moisture and other favorable climate conditions, forage may be produced. Because of the unique characteristics of ephemeral range, BLM developed special rules to manage this range type, specifically, AUMs are authorized on a year-to-year basis only when sufficient forage exists.

<sup>214</sup> Email communication, AZ BLM, Lake Havasu Field Office, September 22, 2004.

<sup>215</sup> Email communication, AZ BLM, Kingman Field Office, September 24, 2004 and October 13, 2004.

<sup>216</sup> Email communication, AZ BLM, Lake Havasu Field Office, September 22, 2004.

#### **5.4.4.1 Verde Management Unit**

318. The Verde MU encompasses land on three USFS national forests, the Coconino, Prescott, and Tonto National Forests.

*Forest Service, Coconino National Forest*

319. Three allotments overlap with proposed flycatcher critical habitat in the Coconino National Forest on the Verde River. In 1996, approximately 400 acres, or 0.16 percent of the total available acres, on the Windmill allotment was excluded directly for flycatcher-protection.

*Forest Service, Prescott National Forest*

320. Six allotments overlap with proposed flycatcher critical habitat area on the Prescott National Forest side of the Verde River. In 1998, grazing was restricted during the flycatcher breeding season (April 1 to July 31) in the riparian pastures of three of these allotments, Verde, Copper Canyon, and Young. For the remaining three allotments, grazing within the riparian corridor was fenced off in order to provide protection for listed fish species, general riparian health, and to reduce conflict between grazing activities and recreational use of the Verde River.<sup>217</sup>

*Forest Service, Tonto National Forest*

321. Five allotments overlap with proposed flycatcher critical habitat on the Verde River in the Tonto National Forest. Two of these allotments, St. Clair and Bartlett, are currently vacant. The Skeleton Ridge/Ike's Backbone and Red Creek allotments completed a consultation in 1997 and 2000, respectively. Restrictions to livestock grazing, however, did not result from either consultation, whose terms and conditions were limited to continued monitoring of flycatcher presence, livestock use of riparian areas, and surveys to determine the condition of riparian habitat.<sup>218</sup> Currently no livestock grazing occurs on the Sears Club/Chalk Mountain allotment, as this area is undergoing NEPA review.

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<sup>217</sup> Personal communication with Albert Sillas, Fisheries Biologist, Prescott National Forest, September 17, 2004.

<sup>218</sup> Biological Consultation on Grazing on Skeleton Ridge/Ike's Backbone, 2-21-94-I-559, June 25, 1997; Biological Consultation on Grazing on Red Creek, 2-21-99-F-022, March 18, 2000.

#### **5.4.4.2 Roosevelt Management Unit**

##### *Forest Service*

322. Nineteen allotments overlap proposed flycatcher critical habitat in the Tonto National Forest. The Tonto National Forest has the greatest number of past consultations (5) that have considered the impact of grazing activities on the flycatcher of any national forest. Conservation activities implemented under these consultations have included survey and monitoring of flycatcher and flycatcher habitat, implementing an annual cowbird management program, monitoring of livestock use of riparian areas, conducting annual reviews of issued grazing permits to determine the feasibility of grazing the suggested number of cattle, and removing trespass livestock from riparian areas.

#### **5.4.4.3 Middle Gila/San Pedro Management Unit**

##### *Arizona Bureau of Land Management*

323. The Middle Gila/San Pedro MU includes BLM grazing lands along the Gila River and the San Pedro River. Along the Gila River, 20 allotments overlap proposed flycatcher critical habitat. In October 2003, BLM consulted on the ongoing grazing activities of the majority of these allotments, six of which were classified as riparian habitat and of concern to the flycatcher. As a result of the 2000 consultation, BLM excluded livestock grazing in the riparian corridors of the majority of these allotments. On the Rafter Six allotment, livestock was restricted to winter grazing of riparian pastures from November 1 to April 1 and utilization levels were limited to 30 percent. For this allotment, this analysis assumes that the number of AUMs reduced is equal to the 30 percent utilization level required by the biological consultation. Currently, 1,055 AUMs are authorized for this allotment. A 30 percent reduction in AUMs translates to an approximate reduction of 317 AUMs. Future impacts to grazing on the Gila River are possible on the seven BLM allotments where riparian grazing still takes place, or for allotments that are currently in non-use, but could be reauthorized.
324. Along the San Pedro River, four allotments overlap proposed flycatcher critical habitat on BLM lands. No past conservation activities for the flycatcher have been implemented in this area. Future impacts to grazing on the San Pedro River are possible on all of these allotments, which currently allow grazing of the riparian areas.

#### **5.4.4.4 Upper Gila Management Unit**

325. The Upper Gila Grande MU encompasses land on the Gila National Forest and on land owned and administered by the New Mexico Bureau of Land Management.

*Forest Service*

326. Along the Lower Gila River, three allotments overlap with proposed flycatcher critical habitat in the Gila National Forest. Livestock grazing on the Watson Mountain and Brock Canyon allotments was discontinued in April 1999 due both to riparian health and the protection of endangered species, primarily the flycatcher, loach minnow, and spike dace. Removing livestock grazing from these allotments resulted in a total reduction of 3,336 AUMs. To be conservative, this analysis attributes the total number of AUMs reduced due to this closure to the flycatcher, although some impacts of the closure resulted from the presence of other species.
327. The entire river corridor on the third allotment, Gila River, was fenced off and excluded in 1997 and 1998. The initial exclusion was driven primarily by the loach minnow; however the exclusion is maintained in part due to the flycatcher.<sup>219</sup>

*New Mexico Bureau of Land Management*

328. Livestock were excluded from the riparian areas of grazing allotments administered by BLM along the Gila River in 2000. In the 1990s, BLM initiated an EIS for Riparian and Aquatic Habitat Management driven in part by the declining health of riparian areas along the river and as part of a settlement agreement involving litigation on NEPA and ESA Section 7 compliance. This action resulted in the exclusion of livestock from the riparian corridors in order to provide for the restoration and protection of riparian habitat on BLM lands under the Las Cruces Field Office.<sup>220</sup>

## **5.4.5 RIO GRANDE RECOVERY UNIT**

### **5.4.5.1 San Luis Valley Management Unit**

*Colorado Bureau of Land Management*

329. Only one allotment, McIntyre-Simpson, overlaps with proposed flycatcher critical habitat on BLM lands in this unit. This allotment was recently acquired by the BLM (2003), and to date, does not have a grazing management plan. A management plan for this approximately 1,050-acre allotment is not expected for another five years.<sup>221</sup> Past grazing on the allotment has been fairly intensive and it is unknown at this time what level of AUMs will be authorized.

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<sup>219</sup> Personal communication with Ralph Pope, Ranger, Silver City Ranger District, Gila National Forest, August 25, 2004.

<sup>220</sup> Bureau of Land Management. 2000. Final Environmental Impact Statement for Riparian and Aquatic Habitat Management in the Las Cruces Field Office-New Mexico. Volumes 1 and 2.

<sup>221</sup> Personal communication with Melissa Scott, CO Bureau of Land Management, August 31, 2004.

#### **5.4.5.2 Upper and Middle Rio Grande Management Unit**

330. The Upper and Middle Rio Grande MU encompasses land on one USFS national forest, the Carson National Forest, and on grazing land owned and administered by the New Mexico Bureau of Land Management.

##### *Forest Service*

331. Two allotments overlap with proposed flycatcher critical habitat in the Carson National Forest, Miranda and Rio Pueblo. Both allotments experienced some restriction in the use of riparian areas for grazing due to the flycatcher in 1998. For the Rio Pueblo Allotment, this resulted in a reduction of 58 AUMs. No reduction in AUMs was realized on the Miranda allotment.<sup>222</sup>

##### *NM Bureau of Land Management*

332. One allotment, Bruton River, overlaps proposed flycatcher critical habitat along the Rio Grande. This allotment falls on land owned by USBR but grazing is administered by BLM. The Bruton River allotment has had a long history of consultation with the Service beginning April 1997 when all livestock grazing was prohibited during the flycatcher breeding season, from April 15, 1997 to July 31, 1997.
333. This process was repeated in 1998 and 1999 with similar result. In 1999, USBR took steps to avoid “take” and potential violations of the ESA, directing BLM to immediately modify the year-long grazing authorization for the Bruton River allotment to exclude grazing from August 1, 1999 through October 15, 1999. On behalf of USBR, BLM issued a Full Force and Effect Decision dated October 1, 1999 for the removal of livestock from the Bruton River allotment beginning October 6, 1999 to prevent a “take” under the ESA. On January 26, 2001, a final decision was issued modifying the livestock grazing permit for the Bruton River allotment. Prior to 1997, the Bruton River allotment was authorized for 150 cows year-round, or 1800 AUMs. To prevent the reduction of AUMs, the 2001 decision increased the number of authorized cows from 150 to 198 during the nine months that cattle were authorized on the allotment.
334. In addition to impacts on authorized AUMs, conversations with the BLM Rangeland Management Specialist identified another significant set of costs borne by the permittee since 1997. Specifically, the 1997 decision to remove livestock beginning April 15, 1997 was imposed on the permittee without much advance notice; as a result, the permittee incurred substantial costs to quickly move livestock to another location. The permittee also decided to appeal the 1997 and 1998 decisions to remove livestock during the flycatcher breeding season, resulting in significant legal and attorney fees. Estimates of these costs, however, are not available.

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<sup>222</sup> Personal communication with Melvin Herrera, Range Conservationist, Carson National Forest, August 26, 2004.

#### **5.4.6 Summary of Past Impacts on Grazing Activities**

335. This analysis estimates that a total of 4,000 to 9,000 AUMs have been reduced as a result of past flycatcher conservation actions, resulting in past permit value losses to ranchers between \$350,000 to \$750,000 (2004 dollars). As shown in Exhibit 5-9, total costs related to past impacts on grazing on USFS and BLM lands are estimated at \$1.5 million to \$2.3 million (2004 dollars).

#### **5.4.7 Summary of Future Impacts on Grazing Activities**

336. This analysis forecasts total future grazing reductions of 300 to 89,000 AUMs as a result of flycatcher conservation, resulting in future permit value losses to ranchers between \$27,000 and \$13.5 million (2004 dollars). This wide range is driven by permit values losses attributed to non-federal lands, estimated at \$13.5 million (2004 dollars), or 99 percent of total losses due to reductions in grazing effort (permit value). The San Luis Valley MU accounts for the greatest proportion of these costs at \$4.0 million, or 30 percent of total losses; followed by the Middle Rio Grande and the Bill Williams MUs, each contributing 15 and 11 percent respectively.
337. As shown in Exhibit 5-10, total costs, including other project modifications, related to forecast future impacts on grazing on USFS, BLM, and non-federal lands are estimated at \$1.7 million to \$17.9 million (2004 dollars, assuming a rate of seven percent over the next 20 years). The large variation between the low bound and high bound estimate is driven by the assumption in the high bound estimate that private landowners will modify grazing practices in order to avoid incidental take under section 9.<sup>223</sup>

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<sup>223</sup> As stated above, the Service questions the assumption that critical habitat designation will affect private grazing efforts in the future. Comments of Regional Director, Service Region 2, Albuquerque, NM, January 5, 2005; Comments of Southwest Regional Office of the Solicitor, January 3, 2005; Comments of Service, Grand Junction, Colorado, Ecological Services Office, January 3, 2005.

**Exhibit 5-9**

**PAST IMPACTS ON LIVESTOCK GRAZING DUE TO FLYCATCHER CONSERVATION ACTIVITIES, 1995-2003<sup>1,2,3</sup>**

Management Unit	Affected Party	CHD Acres <sup>4</sup>	Total Acres <sup>5</sup>	Estimated AUM Reduction		Estimated Permit Value Losses (\$2004)		Other Project Modifications (\$2004)	Total Past Impacts (\$2003)	
				Low	High	Low	High		Low	High
San Diego	USFS	593	15,624	212	220	\$17,000	\$17,700	\$243,400	\$260,400	\$278,100
Kern	USFS	240	3,332	250	250	\$20,100	\$20,100	\$17,100	\$37,200	\$57,300
Little Colorado	USFS	538	49,714	-	111	\$0	\$8,900	\$20,800	\$20,800	\$29,700
Verde	USFS	6,452	830,101	-	367	\$0	\$29,500	\$159,700	\$159,700	\$189,200
Roosevelt	USFS	16,343	781,644	73	1,514	\$5,900	\$121,500	\$293,600	\$299,500	\$421,000
Middle Gila/San Pedro	BLM	4,535	338,338	323	361	\$28,400	\$31,800	\$127,400	\$155,800	\$187,600
Upper Gila	USFS	1,574	54,591	3,336	3,423	\$267,700	\$274,700	\$86,500	\$354,200	\$628,900
Upper Gila	BLM	7,664	102,496	-	1,760	\$0	\$155,100	\$241,300	\$241,300	\$396,400
Upper Rio Grande	USFS	123	84,887	58	61	\$4,700	\$4,900	\$7,400	\$12,100	\$17,000
Middle Rio Grande	BLM	4,012	5,775	2	1,250	\$200	\$110,200	\$0	\$200	\$110,400
<b>USFS Subtotal:</b>		<b>25,864</b>	<b>1,819,893</b>	<b>3,929</b>	<b>5,948</b>	<b>\$315,400</b>	<b>\$477,300</b>	<b>\$828,500</b>	<b>\$1,143,900</b>	<b>\$1,621,200</b>
<b>BLM Subtotal:</b>		<b>16,210</b>	<b>446,608</b>	<b>325</b>	<b>3,372</b>	<b>\$28,600</b>	<b>\$297,100</b>	<b>\$368,700</b>	<b>\$397,300</b>	<b>\$694,400</b>
<b>TOTAL:</b>		<b>42,074</b>	<b>2,266,501</b>	<b>4,254</b>	<b>9,319</b>	<b>\$344,000</b>	<b>\$774,400</b>	<b>\$1,197,200</b>	<b>\$1,541,200</b>	<b>\$2,315,600</b>
<b>Annual Costs (\$2003, 7%):</b>									<b>\$194,000</b>	<b>\$291,500</b>
<b>Annual Costs (\$2003, 3%):</b>									<b>\$154,800</b>	<b>\$232,600</b>

Notes:

<sup>1</sup> This analysis did not identify any past flycatcher consultations for livestock grazing activities on non-federal lands.

<sup>2</sup> Estimated permit values calculated assuming a permit value of \$80 per USFS AUM and \$88 per BLM/private AUM.

<sup>3</sup> Numbers may not add due to rounding.

<sup>4</sup> Equals the number of acres designated as proposed flycatcher critical habitat within the grazing allotment.

<sup>5</sup> Equals the total number of acres within the grazing allotment.

**Exhibit 5-10**

**FUTURE IMPACTS ON LIVESTOCK GRAZING DUE TO FLYCATCHER CONSERVATION ACTIVITIES, 2004-2023**

Management Unit	Affected Party	Estimated AUM Reduction		\$/AUM	Estimated Permit Value Losses (\$2004)		Other Project Modifications (Nominal \$)*	Total Future Impacts (\$2004, 7%)		Total Future Impacts (\$2004, 3%)	
		Low	High		Low	High		Low	High	Low	High
Santa Ynez	Private	-	2,565	\$195	-	\$500,100	\$260,000	\$0	\$638,000	\$0	\$694,000
Santa Ana	Private	-	5,069	\$195	-	\$988,400	\$260,000	\$0	\$1,126,000	\$0	\$1,182,000
San Diego	USFS	-	-	\$80	-	0	\$260,000	\$138,000	\$138,000	\$193,000	\$193,000
San Diego	Private	-	705	\$195	-	\$137,500	\$260,000	\$0	\$275,000	\$0	\$331,000
Owens	Private	-	7,867	\$195	-	\$1,534,000	\$260,000	\$0	\$1,672,000	\$0	\$1,727,000
Kern	USFS	-	-	\$80	-	0	\$260,000	\$138,000	\$138,000	\$193,000	\$193,000
Kern	Private	-	3,355	\$195	-	\$654,300	\$260,000	\$0	\$792,000	\$0	\$848,000
Mojave	Private	-	986	\$195	-	\$192,200	\$260,000	\$0	\$330,000	\$0	\$386,000
Little Colorado	USFS	-	111	\$80	-	\$8,900	\$260,000	\$138,000	\$147,000	\$193,000	\$202,000
Little Colorado	Private	-	51	\$109	-	\$5,500	\$260,000	\$0	\$143,000	\$0	\$199,000
Virgin	BLM	-	54	\$88	-	\$4,700	\$275,919	\$146,000	\$142,000	\$205,000	\$198,000
Virgin	Private	-	2,396	\$109-\$168	-	\$371,300	\$260,000	\$0	\$517,000	\$0	\$577,000
Pahranagat	Private	-	47	\$152	-	\$7,200	\$260,000	\$0	\$145,000	\$0	\$201,000
Bill Williams	BLM	96	529	\$88	\$8,500	\$46,600	\$194,487	\$112,000	\$150,000	\$153,000	\$191,000
Bill Williams	Private	-	6,975	\$109	-	\$760,300	\$260,000	\$0	\$898,000	\$0	\$954,000
Hoover to Parker	Private	-	24	\$109	-	\$2,600	\$260,000	\$0	\$140,000	\$0	\$196,000
Parker to Southerly International	Private	-	522	\$109	-	\$56,900	\$260,000	\$0	\$195,000	\$0	\$250,000
Verde	USFS	-	305	\$80	-	\$24,400	\$586,988	\$311,000	\$335,000	\$437,000	\$461,000
Verde	Private	-	1,754	\$109	-	\$191,200	\$260,000	\$0	\$329,000	\$0	\$385,000
Roosevelt	USFS	-	-	\$80	-	0	\$193,012	\$102,000	\$102,000	\$144,000	\$144,000
Roosevelt	Private	-	930	\$109	-	\$101,400	\$260,000	\$0	\$239,000	\$0	\$295,000
Middle Gila/San Pedro	BLM	214	271	\$88	\$18,900	\$23,900	\$47,015	\$44,000	\$49,000	\$54,000	\$59,000
Middle Gila/San Pedro	Private	-	10,789	\$109	-	\$1,176,000	\$260,000	\$0	\$1,314,000	\$0	\$1,369,000
Upper Gila	USFS	-	-	\$80	-	0	\$260,000	\$138,000	\$138,000	\$193,000	\$193,000
Upper Gila	BLM	-	-	\$88	-	0	\$262,579	\$139,000	\$139,000	\$195,000	\$195,000
Upper Gila	Private	-	5,716	\$109-\$124	-	\$663,900	\$260,000	\$0	\$802,000	\$0	\$857,000
San Luis Valley	Private	-	21,578	\$188	-	\$4,056,700	\$260,000	\$0	\$4,194,000	\$0	\$4,250,000

**Exhibit 5-10**

**FUTURE IMPACTS ON LIVESTOCK GRAZING DUE TO FLYCATCHER CONSERVATION ACTIVITIES, 2004-2023**

Management Unit	Affected Party	Estimated AUM Reduction		\$/AUM	Estimated Permit Value Losses (\$2004)		Other Project Modifications (Nominal \$)*	Total Future Impacts (\$2004, 7%)		Total Future Impacts (\$2004, 3%)	
		Low	High		Low	High		Low	High	Low	High
Upper Rio Grande	USFS	-	-	\$80	-	0	\$260,000	\$138,000	\$138,000	\$193,000	\$193,000
Upper Rio Grande	Private	-	583	\$124	-	\$72,200	\$260,000	\$0	\$210,000	\$0	\$266,000
Middle Rio Grande	BLM	-	-	\$88	-	0	\$260,000	\$138,000	\$138,000	\$193,000	\$193,000
Middle Rio Grande	Private	-	16,176	\$124	-	\$2,005,800	\$260,000	\$0	\$2,144,000	\$0	\$2,199,000
<b>USFS Subtotal:</b>		<b>-</b>	<b>416</b>		<b>\$0</b>	<b>\$33,300</b>	<b>\$2,080,000</b>	<b>\$1,103,000</b>	<b>\$1,136,000</b>	<b>\$1,546,000</b>	<b>\$1,579,000</b>
<b>BLM Subtotal:</b>		<b>311</b>	<b>854</b>		<b>\$27,400</b>	<b>\$75,200</b>	<b>\$1,024,081</b>	<b>\$579,000</b>	<b>\$618,000</b>	<b>\$800,000</b>	<b>\$836,000</b>
<b>Non-Federal Subtotal:</b>		<b>-</b>	<b>88,087</b>		<b>\$0</b>	<b>\$13,477,500</b>	<b>\$4,955,919</b>	<b>\$0</b>	<b>\$16,103,000</b>	<b>\$0</b>	<b>\$17,166,000</b>
<b>Total:</b>		<b>311</b>	<b>89,357</b>		<b>\$27,400</b>	<b>\$13,586,000</b>	<b>\$8,060,000</b>	<b>\$1,682,000</b>	<b>\$17,857,000</b>	<b>\$2,346,000</b>	<b>\$19,581,000</b>
<b>Annual Costs (\$2004):</b>								<b>\$159,000</b>	<b>\$1,686,000</b>	<b>\$158,000</b>	<b>\$1,316,151</b>

\* Other project modifications are calculated assuming \$13,000 per year (see Exhibit 5-7, section 5.2.3) for 20 years, and include costs associated with fence construction, fence maintenance, and cowbird trapping programs. For private parties, this analysis assumes that no costs for other project modifications are incurred if no AUM reductions occur.

## 5.4.8 Regional Economic Impacts

338. This section presents the regional economic impacts expected to result from reductions in grazed AUMs generated by flycatcher conservation activities. The above analysis estimates:
- Approximately 4,300 to 9,200 AUMs reduced each year on Federal grazing lands due to flycatcher conservation activities since 1992.<sup>224</sup>
  - Approximately 300 to 90,000 AUMs reduced each year on Federal and non-federal grazing lands over the next 20 years due to flycatcher conservation activities.
339. Decreases in livestock production due to reductions in AUMs in proposed flycatcher critical habitat areas will occur only if no substitute forage is available. In general, it has been documented that ranchers work to maintain the size of existing herds following changes in public land forage availability. For example, Rimbey et al. states that when faced with changes to public forage availability, ranchers “would do everything they could do to maintain their existing herd. Depending upon when the reductions occurred during the year, the ranchers identified alternatives for maintaining herd size and remaining in business: purchase (or not sell) additional hay (to replace forage in winter, early spring, or late fall), and look for private pasture and rangeland leases (summer forage). The last alternative mentioned by ranchers was the reduction in the number of cattle they would run on their ranches.”<sup>225</sup> Torell et al. state that “given the stated and observed desire to remain in ranching, perhaps, the most reasonable assumption for policy analysis is that western ranchers will continue in business until forced to leave.”<sup>226</sup> In another example, Rowe et al. states that “in general, ranchers favor finding alternatives to Federal forage rather than selling their ranch if faced with reductions in Federal forage.”<sup>227</sup> Given observed rancher behavior, it is unclear that a reduction in permitted or authorized AUMs in proposed flycatcher critical habitat areas would necessarily lead to a reduction in herd size, as long as replacement forage is available.
340. However, given the localized nature of ranching and the increasing number of restrictions on ranching behavior overall, it is possible that reductions in forage availability on public land associated with flycatcher conservation could occur in areas where substitute forage is not available, or where supplemental forage is prohibitively expensive. This analysis assumes that AUMs will be reduced as a result of flycatcher conservation (i.e.,

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<sup>224</sup> Note that this estimate includes the co-extensive impacts of the flycatcher with other causes unrelated to ESA.

<sup>225</sup> Rimbey, N., T. Darden, A. Torrell, J. Tanaka, L. Van Tassel, and J.D. Wulforst. “Ranch Level Economic Impacts of Public Land Grazing Policy Alternatives in the Bureau Resource Area of Owyhee County, Idaho.” Agricultural Economics Extension Series No. 03-05, University of Idaho, College of Agricultural and Life Sciences, June 2003.

<sup>226</sup> Torell, L. Allen et al., “The Lack of Profit Motive for Ranching: Implications for Policy Analysis,” *Current Issues in Rangeland Economics, Proceedings of a Symposium Sponsored by Western Coordinating Committee 55 (WCC-55)*, February 2001.

<sup>227</sup> Rowe, Helen I., M. Shinderman, and E.T. Bartlett, “Change on the range.” *Rangelands* 23 (2), April 2001.

effectively assuming that no replacement forage is available). This analysis captures the value of these losses to rancher wealth by assuming that ranchers lose the value of these AUMs.

341. To estimate the regional economic impact of grazing restrictions, this analysis first estimates the number of AUMs likely to be lost annually as a result of flycatcher conservation activities. Direct effects are calculated by converting this AUM reduction to an estimated loss in livestock production. Next, the analysis utilizes IMPLAN to estimate indirect and induced impacts on the region in terms of output and jobs.

#### *Running the IMPLAN Model*

342. For purposes of this regional economic impact analysis, the study area includes 29 counties in Arizona, New Mexico, Colorado, Utah, Nevada, and California. The study area includes only the counties in which flycatcher critical habitat is proposed, with the exception of four counties containing large urban areas: Maricopa County Arizona (Phoenix), Pima County Arizona (Tucson), Bernalillo County New Mexico (Albuquerque), and Clark County Nevada (Las Vegas). These four counties are excluded from the analysis because including their large economies would likely mask the impacts within the region's rural areas likely to be significantly affected by restrictions to grazing activity. This scale at which regional economic impacts are modeled was determined by considering that the overall impact of this activity relative to the size of the sector is small. While it would be possible to run the IMPLAN model at the individual county level, at that fine scale, some regional impacts may "leak out" of the analysis and cause the impacts to appear smaller yet.
343. Restrictions in grazing activity will primarily affect the livestock-related sectors of the economy. Decreased operations in these industries would also result in secondary effects on related sectors in the study area. Some of these related sectors may be closely associated with the livestock, such as feed grains and hay and pasture; while others may be less closely associated with the industry, such as the insurance sector.
344. This analysis relies on regional economic modeling to estimate the economic impacts of these initial and secondary effects. In particular, it utilizes a software package called IMPLAN to estimate the total economic effects of the reduction in economic activity in the livestock-related industries in the study area. IMPLAN is commonly used by State and Federal agencies for policy planning and evaluation purposes. The model draws upon data from several Federal and State agencies, including the Bureau of Economic Analysis and the Bureau of Labor Statistics.
345. IMPLAN translates initial changes in expenditures into changes from demand for inputs to affected industries. These effects can be described as direct, indirect, or induced, depending on the nature of the change:
- *Direct effects* represent changes in output attributable to a change in demand or a supply shock. These are specified initially by the modeler (e.g., the change in recreation expenditures on goods and services, by sector);

- *Indirect effects* are changes in output industries that supply goods and services to those that directly affected by the initial change in expenditures; and
- *Induced effects* reflect changes in household consumption, arising from changes in employment (which in turn are the result of direct and indirect effects). For example, changes in employment in a region may affect the consumption of certain goods and services.

346. These categories are calculated for all industries to determine the regional economic impact of grazing restrictions resulting from flycatcher conservation activities.

#### *Caveats to the IMPLAN Model*

347. There are two important caveats relevant to the interpretation of IMPLAN model estimates, generally, and within the context of this analysis. The first is that the model is static in nature and measures only those effects resulting from a specific policy change (or the functional equivalent specified by the modeler) at a single point in time. Thus, IMPLAN does not account for posterior adjustments that may occur, such as the subsequent re-employment of workers displaced by the original policy change. In the present analysis, this caveat suggests that the long-run net output and employment effects resulting from grazing restrictions are likely to be smaller than those estimated in the model, which implies an upward bias in the estimates. A second caveat to the IMPLAN analysis is related to the model data. The IMPLAN analysis relies upon input/output relationships derived from 1998 data. Thus, this analysis assumes that this historical characterization of the affected counties' economies are a reasonable approximation of current conditions. If significant changes have occurred since 1998 in the structure of the economies of the counties in the study area, the results may be sensitive to this assumption. The magnitude and direction of any such bias are unknown.

#### **5.4.8.1 Past Regional Economic Impact Estimates**

348. Past direct effect of reduced AUMs on annual livestock production are estimated using the high estimate of lost AUMs (Exhibit 5-11). At the high end, this analysis estimates 9,200 AUMs have been lost each year due to flycatcher conservation activities since 1995. The calculation of the direct effect of reduced AUMs on annual livestock production rely on the following assumptions:

- The five-year average of livestock production per head in New Mexico and Arizona (\$758); and<sup>228</sup>
- Value per head is converted to annual forage value (per AUM) by dividing by 18 (\$42).<sup>229</sup>

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<sup>228</sup> Value of all cattle and calves per head (dollar), 1992-2003. NASS, 2002.

<b>Exhibit 5-11</b>				
<b>CALCULATION OF PAST DIRECT EFFECT OF GRAZING REDUCTIONS ON LIVESTOCK PRODUCTION, 1995-2003 (ANNUAL)</b>				
<b>Management Unit</b>	<b>Affected Party</b>	<b>Estimated AUM reduction (annually)<sup>1</sup></b>	<b>Value of Livestock Production (per AUM)<sup>2</sup></b>	<b>Total Livestock Production Loss (annual)<sup>3</sup></b>
San Diego	USFS	220	\$42	\$9,000
Kern	USFS	250	\$42	\$11,000
Little Colorado	USFS	111	\$42	\$5,000
Verde	USFS	367	\$42	\$15,000
Roosevelt	USFS	1,514	\$42	\$64,000
Middle Gila/San Pedro	BLM	361	\$42	\$15,000
Upper Gila	USFS	3,423	\$42	\$144,000
Upper Gila	BLM	1,760	\$42	\$74,000
Upper Rio Grande	USFS	61	\$42	\$3,000
Middle Rio Grande	BLM	1,250	\$42	\$53,000
<b>TOTAL:</b>		<b>9,319</b>		<b>\$391,000</b>
Notes:				
<sup>1</sup> Based on the high estimate of AUM reduction.				
<sup>2</sup> Value of production represents the five year average for NM and AZ.				
<sup>3</sup> Totals may not sum due to rounding.				

349. Exhibit 5-12 presents the results of the IMPLAN analysis. The reduction in livestock production as a result of AUM reductions is shown to have resulted in an annual economic loss of approximately \$650,000 (2004 dollars) in regional output and approximately seven jobs across all sectors of the economy. This impact represents approximately 0.36 percent of total output from the livestock industry in this region.<sup>230</sup>

<sup>229</sup> Assuming one calf per cow and a monthly requirement of 0.5 AUMs per calf. Lewandrowski, Jan and K. Ingram, Restricting Grazing on Federal Lands in the West to Protect Threatened and Endangered Species: Ranch and Livestock Sector Impacts. Review of Agricultural Economics, Volume 24, Number 1 (78-107).

<sup>230</sup> This data is from IMPLAN for the Range-Fed, Ranch-Fed and Cattle Feedlots livestock sectors.

<p align="center"><b>Exhibit 5-12</b></p> <p align="center"><b>PAST REGIONAL ECONOMIC IMPACT OF REDUCTIONS IN LIVESTOCK PRODUCTION, 1995-2003 (ANNUAL)*</b></p>					
<b>Management Unit</b>	<b>Affected Party</b>	<b>Direct Effect (Output)</b>	<b>Indirect Effect (Output)</b>	<b>Induced Effect (Output)</b>	<b>Total Impact (Output)</b>
San Diego	USFS	\$10,000	\$3,000	\$2,000	\$15,000
Kern	USFS	\$11,000	\$4,000	\$3,000	\$17,000
Little Colorado	USFS	\$5,000	\$2,000	\$1,000	\$8,000
Verde	USFS	\$16,000	\$6,000	\$4,000	\$26,000
Roosevelt	USFS	\$66,000	\$24,000	\$17,000	\$106,000
Middle Gila/San Pedro	BLM	\$16,000	\$6,000	\$4,000	\$25,000
Upper Gila	USFS	\$148,000	\$53,000	\$38,000	\$239,000
Upper Gila	BLM	\$76,000	\$27,000	\$19,000	\$123,000
Upper Rio Grande	USFS	\$3,000	\$1,000	\$1,000	\$4,000
Middle Rio Grande	BLM	\$54,000	\$19,000	\$14,000	\$87,000
<b>TOTAL OUTPUT:</b>		<b>\$405,000</b>	<b>\$145,000</b>	<b>\$103,000</b>	<b>\$650,000</b>
<b>TOTAL EMPLOYMENT:</b>		<b>3.30</b>	<b>1.80</b>	<b>1.50</b>	<b>6.50</b>
* Regional economic impact measures represent one-time changes in economic activity (i.e., not present values); thus, these estimates represent annual losses.					

#### 5.4.8.2 Future Regional Economic Impact Estimates

350. Future regional economic impacts are estimated using the high estimate of lost AUMs (Exhibit 5-13). At the high end, this analysis estimates future AUMs reductions of 89,300 AUMs due to flycatcher conservation activities. The calculation of the direct effect of future reductions in AUMs on annual livestock production relies on the same assumptions as the analysis of past impacts:

- The five-year average of livestock production per head in New Mexico and Arizona (\$758); and<sup>231</sup>
- Value per head is converted to annual forage value (per AUM) by dividing by 18 (\$42).<sup>232</sup>

351. Exhibit 5-14 presents the results of the IMPLAN analysis. The future reduction in livestock production as a result of AUM reductions is shown to result in an annual economic loss of approximately \$5.4 million (2004 dollars) in regional output and approximately 65 jobs across all sectors of the economy. This impact represents approximately three percent of total output from the livestock industry in this region.<sup>233</sup>

<sup>231</sup> Value of all cattle and calves per head (dollar), 1992-2003. NASS, 2002.

<sup>232</sup> Assuming one calf per cow and a monthly requirement of 0.5 AUMs per calf. Lewandrowski, Jan and K. Ingram, Restricting Grazing on Federal Lands in the West to Protect Threatened and Endangered Species: Ranch and Livestock Sector Impacts. Review of Agricultural Economics, Volume 24, Number 1 (78-107).

<sup>233</sup> This data is from IMPLAN for the Range-Fed, Ranch-Fed and Cattle Feedlots livestock sectors.

**Exhibit 5-13**

**CALCULATION OF FUTURE DIRECT EFFECT OF GRAZING REDUCTIONS  
ON LIVESTOCK PRODUCTION, 2004-2023 (ANNUAL)**

<b>Management Unit</b>	<b>Affected Party</b>	<b>Estimated AUM reduction (annually)<sup>1</sup></b>	<b>Value of Livestock Production (per AUM)<sup>2</sup></b>	<b>Total Livestock Production Loss (annual)<sup>3</sup></b>
Santa Ynez	Non-federal	2,565	\$42	\$108,000
Santa Ana	Non-federal	5,069	\$42	\$213,000
San Diego	Non-federal	705	\$42	\$30,000
Owens	Non-federal	7,867	\$42	\$330,000
Kern	Non-federal	3,355	\$42	\$141,000
Mohave	Non-federal	986	\$42	\$41,000
Little Colorado	USFS	111	\$42	\$5,000
Little Colorado	Non-federal	51	\$42	\$2,000
Virgin	BLM	54	\$42	\$2,000
Virgin	Non-federal	2,396	\$42	\$101,000
Pahranagat	Non-federal	47	\$42	\$2,000
Bill Williams	BLM	529	\$42	\$22,000
Bill Williams	Non-federal	6,975	\$42	\$293,000
Hoover to Parker	Non-federal	24	\$42	\$1,000
Parker to Southerly International	Non-federal	522	\$42	\$22,000
Verde	USFS	305	\$42	\$13,000
Verde	Non-federal	1,754	\$42	\$74,000
Roosevelt	Non-federal	930	\$42	\$39,000
Middle Gila/San Pedro	BLM	271	\$42	\$11,000
Middle Gila/San Pedro	Non-federal	10,789	\$42	\$453,000
Upper Gila	Non-federal	5,716	\$42	\$240,000
San Luis Valley	Non-federal	21,578	\$42	\$906,000
Upper Rio Grande	Non-federal	583	\$42	\$24,000
Middle Rio Grande	Non-federal	16,176	\$42	\$679,000
<b>TOTAL:</b>		<b>89,357</b>		<b>\$3,403,000</b>

Notes:

<sup>1</sup> Based on the high estimate of AUM reduction.

<sup>2</sup> Value of production represents the five year average for NM and AZ.

<sup>3</sup> Totals may not sum due to rounding.

**Exhibit 5-14**

**FUTURE REGIONAL ECONOMIC IMPACT OF REDUCTIONS  
IN LIVESTOCK PRODUCTION, 2004-2023 (ANNUAL)\***

<b>Management Unit</b>	<b>Affected Party</b>	<b>Direct Effect (Output)</b>	<b>Indirect Effect (Output)</b>	<b>Induced Effect (Output)</b>	<b>Total Impact (Output)</b>
Santa Ynez	Non-federal	\$96,000	\$35,000	\$25,000	\$156,000
Santa Ana	Non-federal	\$190,000	\$69,000	\$49,000	\$308,000
San Diego	Non-federal	\$26,000	\$10,000	\$7,000	\$43,000
Owens	Non-federal	\$295,000	\$107,000	\$76,000	\$478,000
Kern	Non-federal	\$126,000	\$46,000	\$33,000	\$204,000
Mohave	Non-federal	\$37,000	\$13,000	\$10,000	\$60,000
Little Colorado	USFS	\$4,000	\$2,000	\$1,000	\$7,000
Little Colorado	Non-federal	\$2,000	\$1,000	\$0	\$3,000
Virgin	BLM	\$2,000	\$1,000	\$1,000	\$3,000
Virgin	Non-federal	\$90,000	\$33,000	\$23,000	\$146,000
Pahrnagat	Non-federal	\$2,000	\$1,000	\$0	\$3,000
Bill Williams	BLM	\$20,000	\$7,000	\$5,000	\$32,000
Bill Williams	Non-federal	\$261,000	\$95,000	\$68,000	\$424,000
Hoover to Parker	Non-federal	\$1,000	\$0	\$0	\$1,000
Parker to Southerly International	Non-federal	\$20,000	\$7,000	\$5,000	\$32,000
Verde	USFS	\$11,000	\$4,000	\$3,000	\$19,000
Verde	Non-federal	\$66,000	\$24,000	\$17,000	\$107,000
Roosevelt	Non-federal	\$35,000	\$13,000	\$9,000	\$57,000
Middle Gila/San Pedro	BLM	\$10,000	\$4,000	\$3,000	\$16,000
Middle Gila/San Pedro	Non-federal	\$404,000	\$147,000	\$105,000	\$656,000
Upper Gila	Non-federal	\$214,000	\$78,000	\$55,000	\$348,000
San Luis Valley	Non-federal	\$808,000	\$294,000	\$209,000	\$1,312,000
Upper Rio Grande	Non-federal	\$22,000	\$8,000	\$6,000	\$35,000
Middle Rio Grande	Non-federal	\$606,000	\$221,000	\$157,000	\$983,000
<b>TOTAL OUTPUT:</b>		<b>\$3,348,000</b>	<b>\$1,220,000</b>	<b>\$867,000</b>	<b>\$5,433,000</b>
<b>TOTAL EMPLOYMENT:</b>		<b>32.30</b>	<b>17.40</b>	<b>14.20</b>	<b>63.90</b>
* Regional economic impact measures represent one-time changes in economic activity (i.e., not present values); thus, these estimates represent annual losses.					

## 5.5 Caveats to Economic Analysis of Impacts on the Livestock Grazing Activities

352. Exhibit 5-15 summarizes the key assumptions of the analysis of economic impacts on the grazing activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

<b>Exhibit 5-15</b>	
<b>CAVEATS TO THE ECONOMIC ANALYSIS ON LIVESTOCK GRAZING ACTIVITIES</b>	
<b>Key Assumption</b>	<b>Effect on Impact Estimate</b>
Although there are many factors that may result in AUM reductions, historical reductions to grazing (permitted AUMs) in flycatcher habitat are assumed to result from flycatcher conservation activities.	+
All private lands supporting rangeland vegetation in Arizona, New Mexico, Colorado, Utah, and Nevada are assumed to be used for livestock grazing.	+
While there is no history of grazing restrictions on private lands for flycatcher, this analysis incorporates a scenario into the high bound estimate that assumes restrictions are likely in the future to reflect the possibility that private landowners may modify their grazing practices to avoid incidental take under section 9.	+/-
For the high-end estimate, this analysis assumes that the entire proposed CHD will be excluded from grazing use due to flycatcher. In fact, many areas have already excluded grazing due to other concerns.	+
For the high-end estimate, this analysis assumes that affected allotments will be retired completely. In fact, the consultation history suggests that grazing may only be disallowed for part of a year.	+
The percent of AUMs reduced on allotments where direct AUM reductions were not known is assumed to be equal to the percentage of the allotment designated as proposed flycatcher critical habitat. This analysis could underestimate (e.g., range managers are able to avoid AUM reductions through changes in grazing management and patterns) or overestimate (e.g., fencing off the riparian corridor results in a greater number of AUMs reduced) the economic impacts.	+/-
The livestock grazing permit value is \$80/AUM on USFS lands, and \$88/AUM on BLM lands.	+/-
For Federal allotments where the actual number of AUMs grazed is unknown, this analysis estimates the AUMs reduced due to flycatcher using the average AUM reduction on Federal grazing lands with known AUMs.	+/-
To estimate the number of AUMs reduced on non-federal grazing lands in the proposed CHD, this analysis utilizes 0.93 AUMs per acre, which suggests that private lands, on average, are four times as productive as Federal lands.	+/-
The IMPLAN model used to estimate regional economic impacts is a static model and does not account for the fact that the economy will adjust. IMPLAN measures the effects of a specific policy change at one point in time. Over the long-run, the economic losses predicted by the model may be overstated as adjustments such as re-employment of displaced employees occurs.	+
The IMPLAN model used to estimate regional economic impacts relies on 1998 data. If significant changes have occurred in the structure of the affected counties economies, the results may be sensitive to this assumption. The direction of any bias is unknown.	+/-
The annual production value of livestock is \$42/AUM.	+/-
- : This assumption may result in an underestimate of real costs. + : This assumption may result in an overestimate of real costs. +/- : This assumption has an unknown effect on the magnitude of cost estimates.	